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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/928,049	08/13/2001	Doron Gamliel	967X	6949

7590 06/30/2004
Kevin Redmond
6960 SW Gator Trail
Palm City, FL 34990

EXAMINER

HASHEM, LISA

ART UNIT	PAPER NUMBER
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2645

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DATE MAILED: 06/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/928,049

Applicant(s)

GAMLIEL, DORON

Examiner

Lisa Hashem

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-21 are pending in this office action.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,854,974 by Li in view of U.S. Patent No. 4,224,572 by Will.

Li discloses a double balanced mixer for mixing an RF input signal with a local oscillator signal to provide at an output an intermediate frequency signal (see Abstract and Figure 3), comprising: (a) a first diode ring (Figure 3, 104) having a first and second input port for receiving the local oscillator signal and a third input port for receiving the RF signal, the first diode ring further having a first output port for providing the intermediate frequency signal; (b) a second diode ring (Figure 3, 108) having a fifth and sixth input port for receiving the local oscillator signal and a seventh input port for receiving the RF signal, the second diode ring further having a third output port for providing the intermediate frequency signal; (c) a first balun connected across the first and second input ports and the fifth and sixth input ports for receiving the local oscillator signal (Figure 3, 114); (d) a second balun connected to the third and

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seventh input ports for receiving the RF signal (Figure 3, 118); and (e) first and second compensation inductors (Figure 3: 150 and 152) connected to the first and third output ports for compensating for the parasitic capacitive reactance developed by the diode switching elements within the first and second diode rings (column 4, lines 6-62).

Li does not disclose a third balun connected to the first and third output ports for providing the intermediate frequency signal.

Will discloses a broadband and doubly balanced mixer for mixing an RF input signal with a local oscillator signal to provide at an output an intermediate frequency signal (see Abstract and Figure 1), comprising: (a) a first diode ring or outer ring (Figure 1, 20); (b) a second diode ring or inner ring (Figure 3, 108); (c) a first balun means (including two baluns; Figure 1: 17, 18) for receiving the local oscillator signal; (d) a second balun means (including two baluns; Figure 1: 11, 12) for receiving the RF signal; and (e) a third balun means (including two baluns; Figure 1: 14, 15) for providing the intermediate frequency signal (column 2, lines 45-63; column 3, line 1 – column 4, line 57; column 5, line 13 – column 6, line 16).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the double balanced mixer of Li to include a third balun means as taught by Rogers for providing the intermediate frequency signal. One of ordinary skill in the art would have been lead to make such a modification since including a third balun by the output port would extend the operating frequency range of the mixer.

Regarding claim 2, the double balanced mixer according to claim 1 mentioned above, wherein Li further discloses the first balun (Figure 3, 114) includes a first transformer that has a

first and a second winding and a second transformer that has a third and fourth winding (Figure 3: 142, 144).

Regarding claim 3, the double balanced mixer according to claim 1 mentioned above, wherein Li further discloses the second balun (Figure 3, 118) includes a third transformer that has a fifth and a sixth winding and a fourth transformer that has a seventh and an eighth winding (Figure 3: 136, 138).

Regarding claim 4, the double balanced mixer according to claim 1 mentioned above, wherein Will further discloses the third balun inherently includes a fifth transformer (Figure 1, 45) that has a ninth and a tenth winding and a sixth transformer (Figure 1, 48) that has an eleventh and a twelfth winding (column 3, lines 44-49; column 4, lines 21-38; column 8, lines 15-25).

Regarding claim 5, the double balanced mixer according to claim 1 mentioned above, wherein Li further discloses each diode ring comprises: a) a first diode having an anode and a cathode; b) a second diode having an anode and a cathode, the cathode of the first diode connected to the anode of the second diode; c) a third diode having an anode and a cathode, the cathode of the second diode connected to the anode of the third diode; and d) a fourth diode having an anode and a cathode, the cathode of the third diode connected to the anode of the fourth diode and the cathode of the fourth diode connected to the anode of the first diode (see Figure 3: 104 and 161-164 and Figure 3: 108 and 171-174).

Regarding claim 6, the double balanced mixer according to claim 1 mentioned above, wherein Li further discloses parasitic elements of the local oscillator signal are inherently cancelled in the second and third baluns (column 4, lines 28-62).

Regarding claim 7, the double balanced mixer according to claim 1 mentioned above, wherein Li further discloses isolation between the local oscillator signal and the RF and intermediate frequency signals is inherently increased (column 4, lines 28-62).

Regarding claims 8, 13, and 14, please see the rejection of the double balanced mixer in claims 1, 6, and 7 mentioned above, respectively, to reject the double balanced mixer in claims 8, 13, and 14.

Regarding claims 9 and 10, please see the rejection of the double balanced mixer in claim 5 mentioned above, to reject the double balanced mixer in claims 9 and 10.

Regarding claims 11 and 12, please see the rejection of the double balanced mixer in claims 2-4 mentioned above, to reject the double balanced mixer in claims 11 and 12.

Regarding claims 15 and 17, please see the rejection of the double balanced mixer in claims 1 and 5 mentioned above, respectively, to reject the method in claims 15 and 17.

Regarding claim 16, the method of double balanced mixing according to claim 15 mentioned above, wherein further discloses the first and second mixers are coupled in parallel (see Figure 3: 104, 108).

Regarding claims 18-20, please see the rejection of the double balanced mixer in claims 1, 16, and 5 mentioned above, respectively, to reject the double balanced mixer in claims 18-20.

Regarding claim 21, please see the rejection of the double balanced mixer in claims 6 and 7 mentioned above, to reject the double balanced mixer in claim 21.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- U.S. Patent Application Publication No. 2002/0032016 by Ji discloses a double balanced mixer for mixing a RF input signal with a local oscillator signal to provide at an output an intermediate frequency signal with a high third order intercept point
- U.S. Patent No. 5,774,801 by Li et al disclose a double-double balanced mixer that includes first and second RF baluns and first and second LO baluns connected to two diode rings

6. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Or faxed to:

(703) 872-9314 (for formal communications intended for entry)

Or call:

(703) 306-0377 (for customer service assistance)

Hand-delivered responses should be brought to: Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lisa Hashem whose telephone number is (703) 305-4302. The examiner can normally be reached on M-F 8:30-5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fan Tsang can be reached on (703) 305-4895. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.

LH

lh

June 16, 2004

FAN TSANG
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

